



Reconstruction de tempêtes historiques sur le littoral portugais

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Les littoraux à l'heure du changement climatique
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Rochefort - Brouage - La Rochelle

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1. Introduction

2. Tempêtes du XX^{eme} siècle

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2. Évolution temporelle
3. Evolution saisonnière
4. Distribution spatiale

3. Tempêtes au XVIII^{eme} siècle

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5. Conclusion



2. Tempêtes du XX^{eme} siècle

Sources: Journal (Diário de Notícias) et données Météo

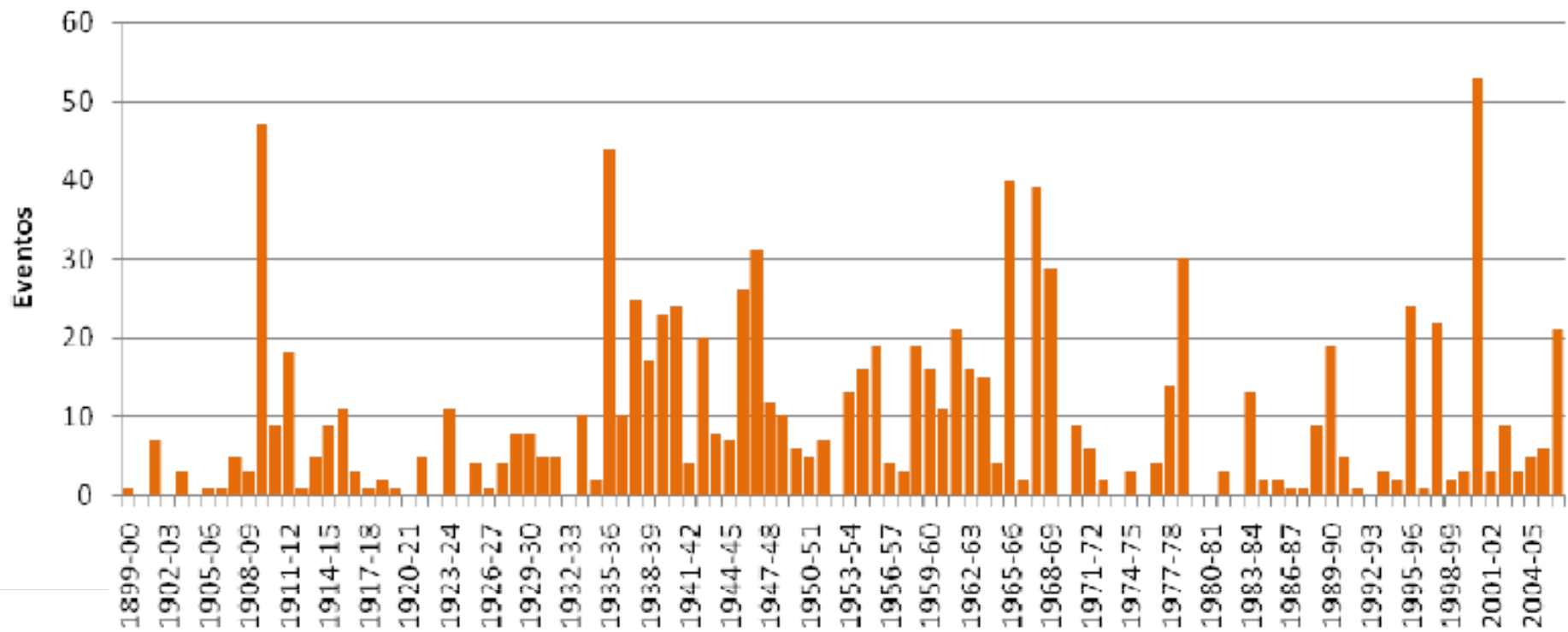
Évolution temporelle

Evolution saisonnière

Distribution spatiale

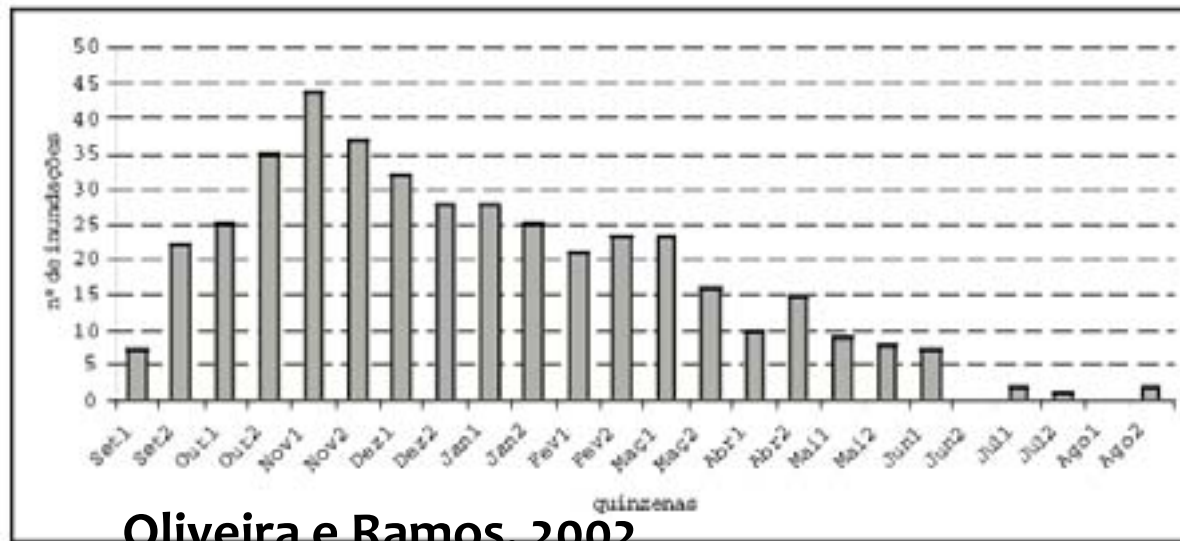
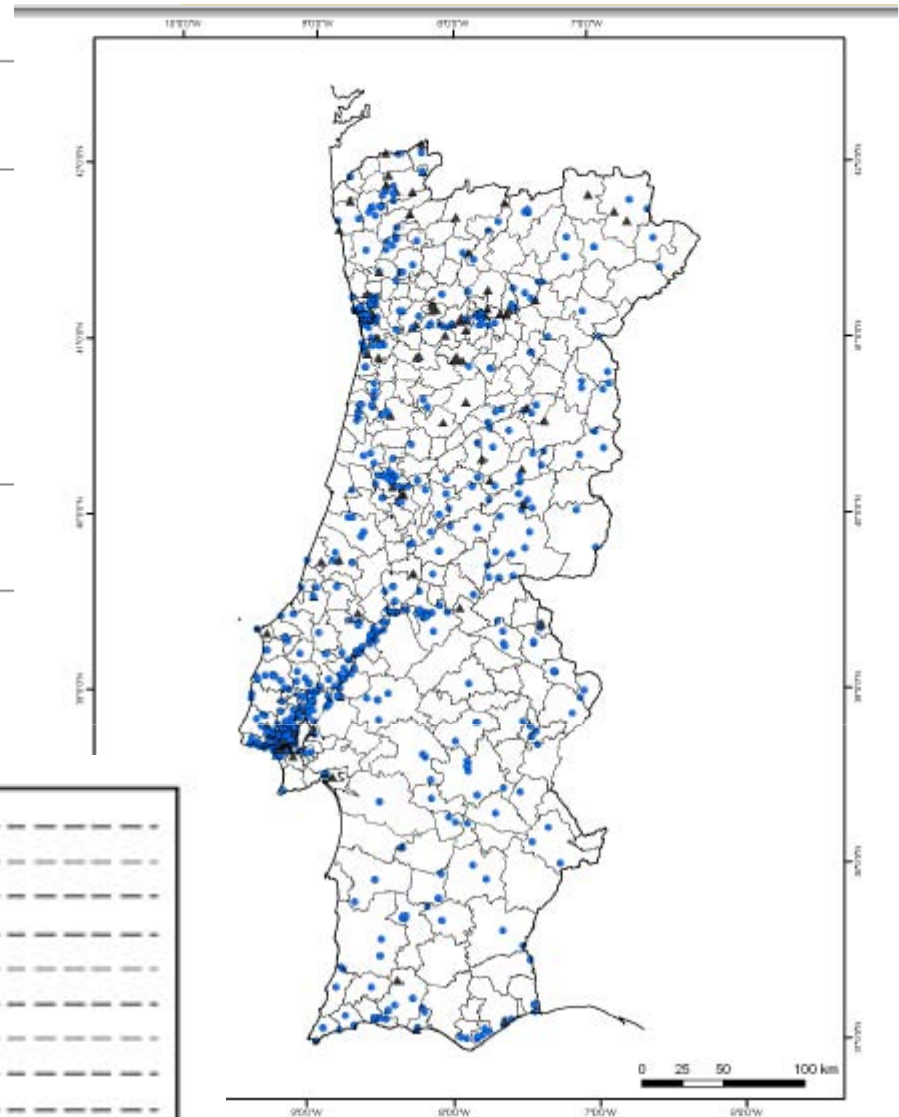
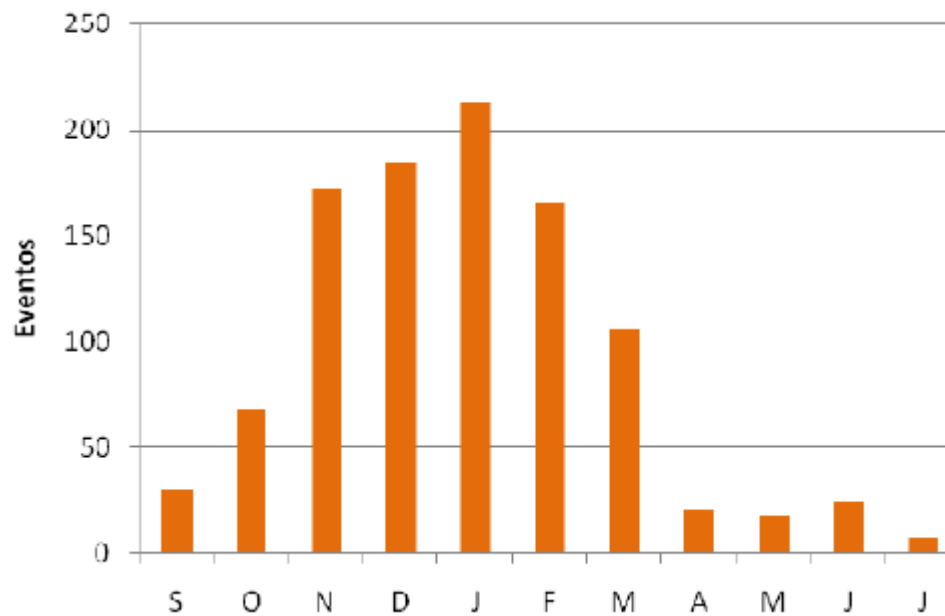
Causes synoptiques

Quaresma, 2008



**Ocurrence
d'évènements à
conséquences hydro-
géomorphologiques
négatives entre 1900 et
2006**

Quaresma, 2008



Oliveira e Ramos, 2002

Fig. 2 – Número de inundações por quinzena na cidade de Lisboa, entre 1918-19 e 1997-98.

Fig. 2 – Number of inundations in Lisbon per two weeks, between 1918-19 and

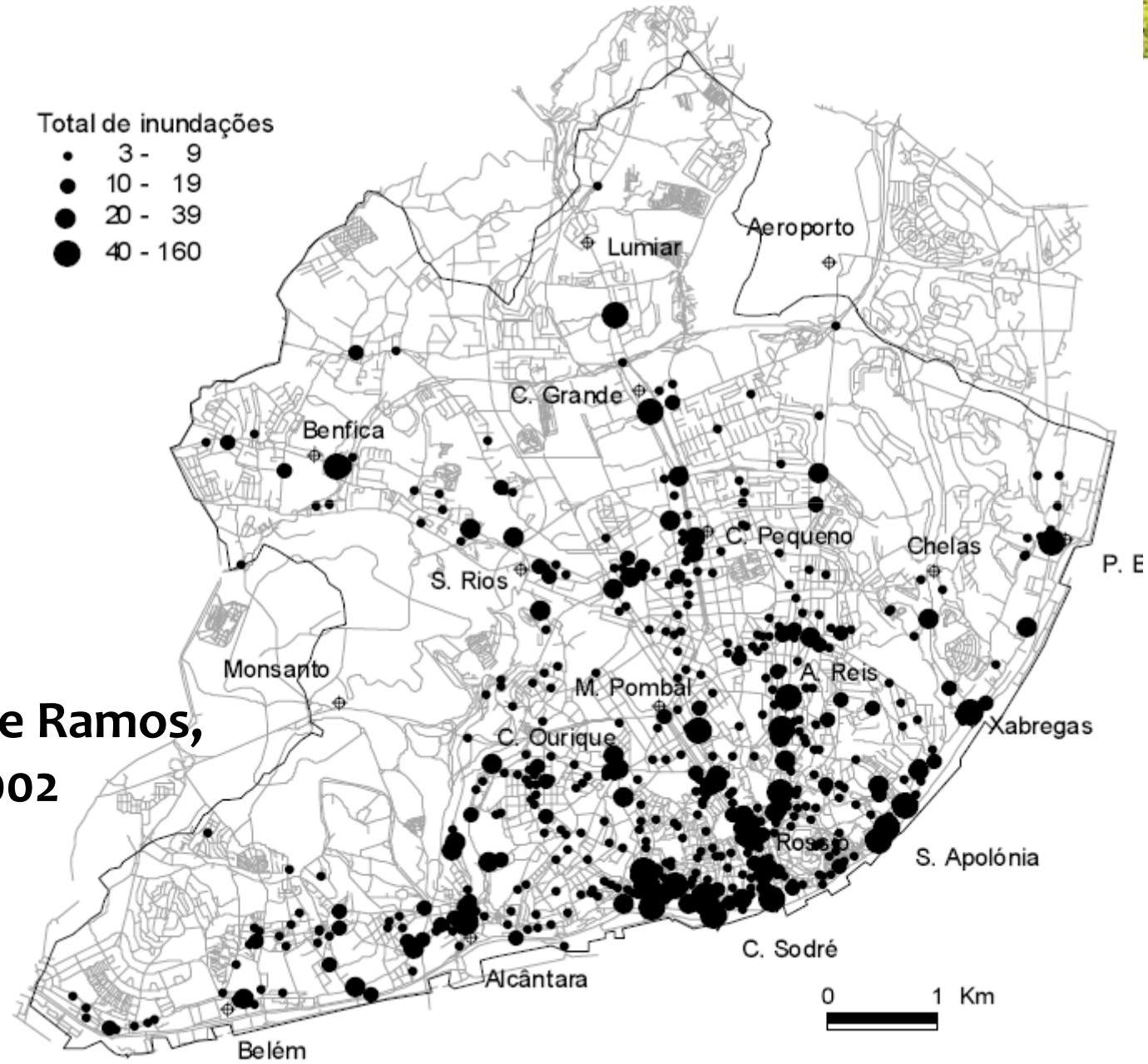
Distribution saisonnière et répartition spatiale des évènements ...

Source: Quaresma, 2008

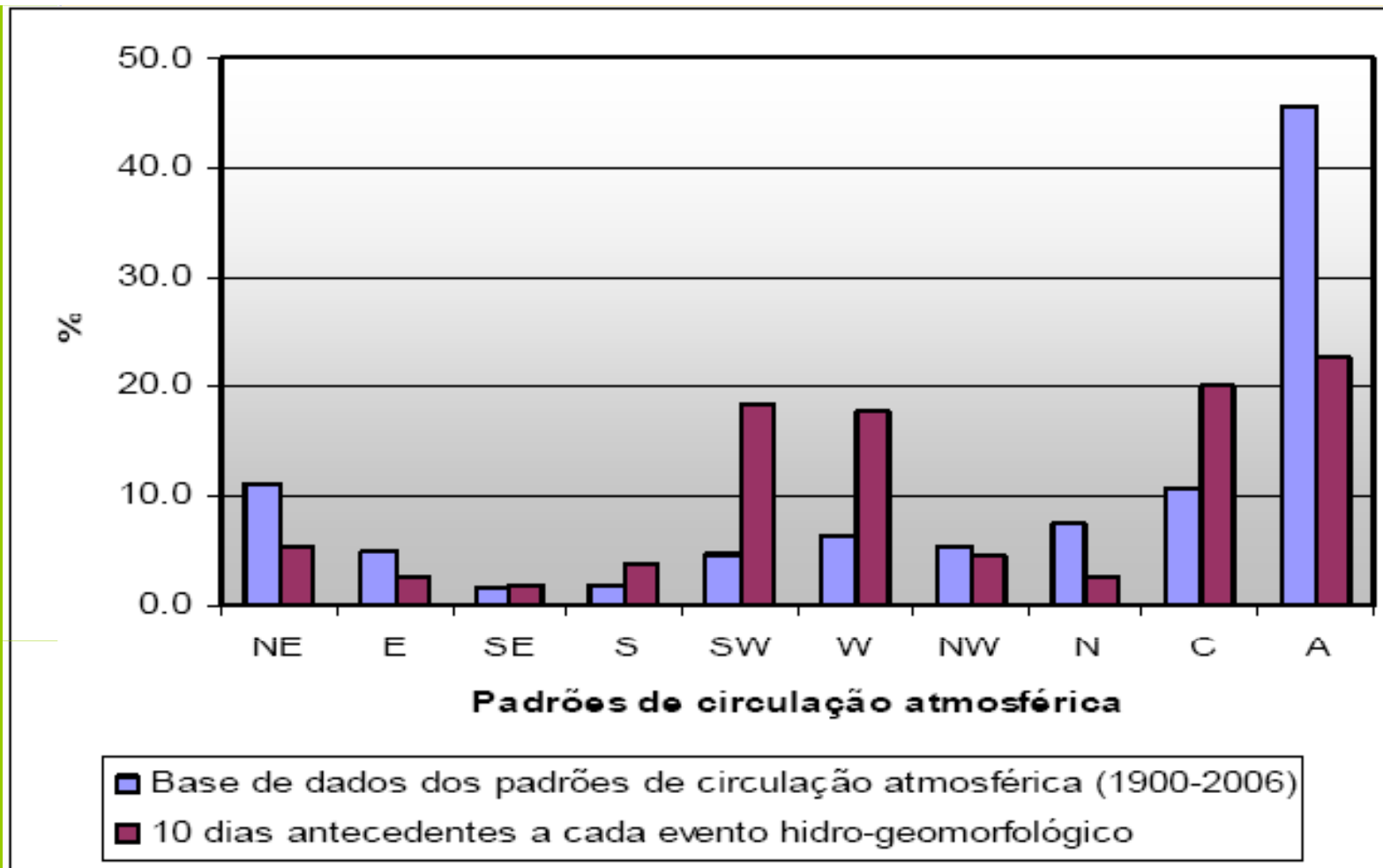


Total de inundações

- 3 - 9
- 10 - 19
- 20 - 39
- 40 - 160



Oliveira e Ramos,
2002



Fréquence du type de circulation atmosphérique entre 1900 et 2007 (bleu) et pendant la période de 10 jours avant chaque épisode hydro-géomorphologique à fort impact (violet).

Source: Quaresma, 2008



3. Tempêtes au XVIII^{eme} siècle

Sources documentales et instrumentales;
Journaux de Bord

Liste provisoire des tempêtes

2. SOURCES

Documentales (Descriptive documentary sources)(1)

- Institutionnelles (manuscripts)
 - Ecclésiastiques et Municipales
- Sources écrites individuelles
 - Almeida: Journal de 1696 à 1716
 - Silva: 1701-16
 - Castro: 1704-1709
 - Matozo (1^{ère} moitié du 18^{ème} siècle)
 - Manuel do Cenáculo (1724-1814)
 - **Alão e Alvarenga** auteurs de longs poèmes concernant les tempêtes de Décembre 1739
 - Lettres de voyageurs
- Journaux de Bord

Sources documentales (2)

Publications périodiques

Gazeta de Lisboa

(1715-1762;
1779-1799)

1757

Num. 19 145

GAZETA DE LISBOA

Com Privilegio de S. Magestade

Quinta feira 12 de Mayõ de 1757.

A L E M A N H A.
Osnabruck 26 de Abril.

OS Francezes vem chegando com paços largos para estas vezinhanças. A guarnição Prussiana que estava em *Wesel* se retirou para *Lippstadt* onde se acha o Principe herdeiro de *Hössa-Cassel*, que recebeu a 17 do corrente hum Correyo de *Hannover* com aviso de haver ali chegado a 16. o Duque de *Cuberlandia*. Com esta noticia partiu logo para aquella Cidade o General *Zastrow*, que já estava em *Hamelen*; e o mesmõ fez o Prefidente de *Minden*, para receberem as ordens de S. A. Real, como Comandante em chefe do

Num. 145

O Folheto
(1740-1750, 1753-1754)

FOLHETO DE LISBOA.

Sabbado 3 de Junho de 1742.

NOTICIAS DA EUROPA.

Pelo Republicão se estabelecerão as fribalinas para Paris, de 1742 a 1754. de qua se estabelecerão a fribalinas que se havia de aver de se embarcadas com a Marinha, q. de 1742 a 1754. chegou em Lisboa a Regata de 1742 por se estabelecer, onde se havia a Comandante a Marinha, e depois de se estabelecer, se havia a 1742 a 1754. e sobre q. se estabelecerão. Os
Inglaterra

1742

Fig. 1 – Gazeta de Lisboa, nº 19, de 12 de Maio de 1757 (página de rosto).

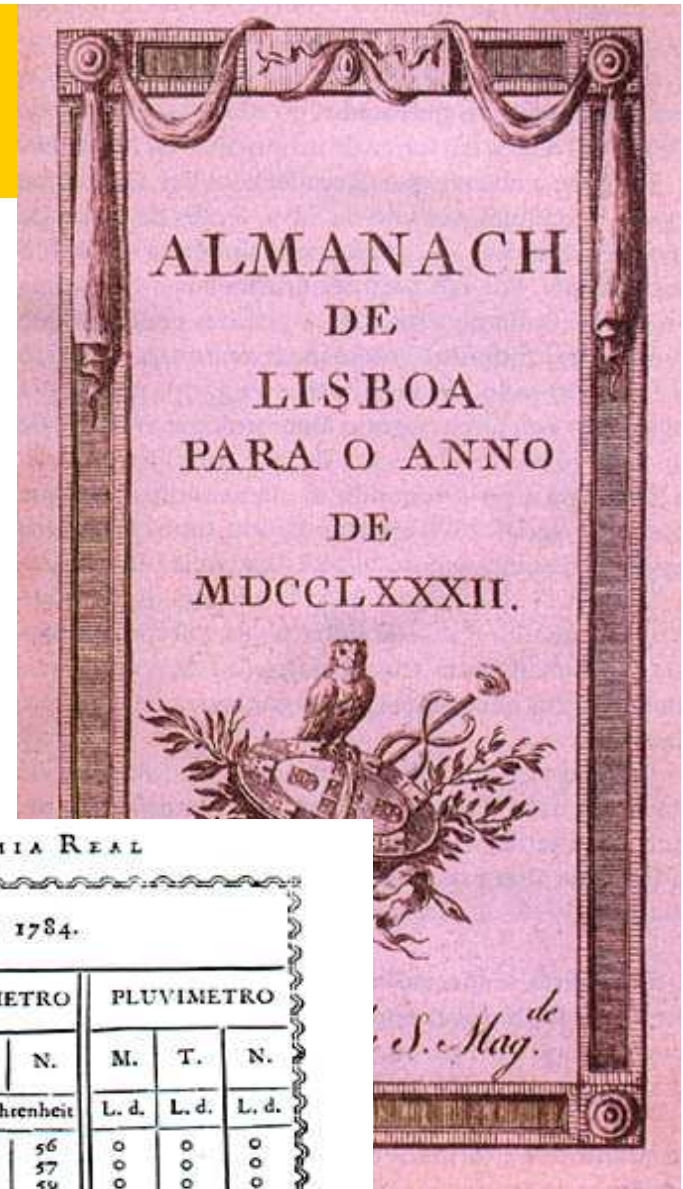
Sources instrumentales

Ingénieurs allemands, au service
de l'armée Portugaise
(décades 1780s) Lisbonne
Pretorius et Schulze

Physicien

Joaquim J Velho

Mesures journalières de 1783 à
1787 à Mafra



494 MEMÓRIAS DA ACADEMIA REAL

O U T U B R O de 1784.

Dias do mez	BAROMETRO			THERMOMETRO			PLUVIMETRO		
	Manhã	Tarde	Noite	M.	T.	N.	M.	T.	N.
	P. L. D.	P. L. D.	P. L. D.	Grad. de Fahrenheit			L. d.	L. d.	L. d.
1	27 8 0	27 8 4	27 8 7	60	66	56	0	0	0
2	27 9 0	27 8 5	27 7 8	54	69	57	0	0	0
3	27 7 8	27 7 8	27 7 8	55	68	59	0	0	0
4	27 7 8	27 7 8	27 7 0	58	65	59	0	0,1	1,1
5	27 6 6	27 6 2	27 5 0	57	62	56	0	1	0
6	27 4 8	27 4 2	27 4 0	54	61	56	0	1	2,8
7	27 4 0	27 4 0	27 5 0	54	60	58	0,2	0	0
8	27 5 6	27 5 8	27 4 5	55	61	60	0	0	1,5
9	27 4 5	27 4 2	27 4 0	58	60	56	0	0,5	0,2
10	27 3 0	27 3 0	27 2 5	55	60	57	0,6	0,2	1,8
11	27 3 0	27 4 0	27 5 0	55	63	57	0,6	0,6	0
12	27 6 0	27 6 2	27 5 5	55	66	59	0	0	0
13	27 6 1	27 4 1	27 3 5	56	66	60	0	0	0
14	27 3 0	27 3 0	27 2 5	58	66	57	0	1,8	0,2
15	27 2 6	27 2 0	27 3 0	55	62	58	0,1	0	0,9
16	27 3 6	27 4 0	27 4 0	54	64	57	0,8	0	0,9

S. Mag. de

STORMS

Liste provisoire

1704 – March. 9

1708 – Very rainy year, several storms, April (S winds), May, 15, Nov 15

1708 - December, 21(or 26) – windstorm in Lisbon. References to rough sea and ships that were drown

1716 – Feb 20

1720, May, 9 – “Hurricane” in Lisbon

1724 – January, 13 – wind storm in the Tagus River 17 persons died.

1724 – November, 19 – Strong SW winds in Lisbon. Description of damages in boats that were anchored (more than 200?!!) Several boats were already charged to sail to Brazil.

1729 – September, 26 wind and rain storm, Tagus River , 52 boats were lost

1731 – February, 6 wind and rain storm that lasted until the 9th + high tide: lots of damages

1731 – October, 3 wind and rain storm in Lisbon

1732 – December, 28 wind and rain storm in Lisbon

1732-October, 15 Strong southern winds in Lisbon

1739 – December, 3-6- Barbara Storm

1742 – December, 3 – Rain and wind (Alcácovas, South Port.)

1746 – May, 1 - Rain and wind (Alcácovas, South Port.)

1747 – January, 24,25,26,27 - Rain and wind (Alcácovas, South Port.)

1751 -

1768 - October



3. Présentation de quelques cas



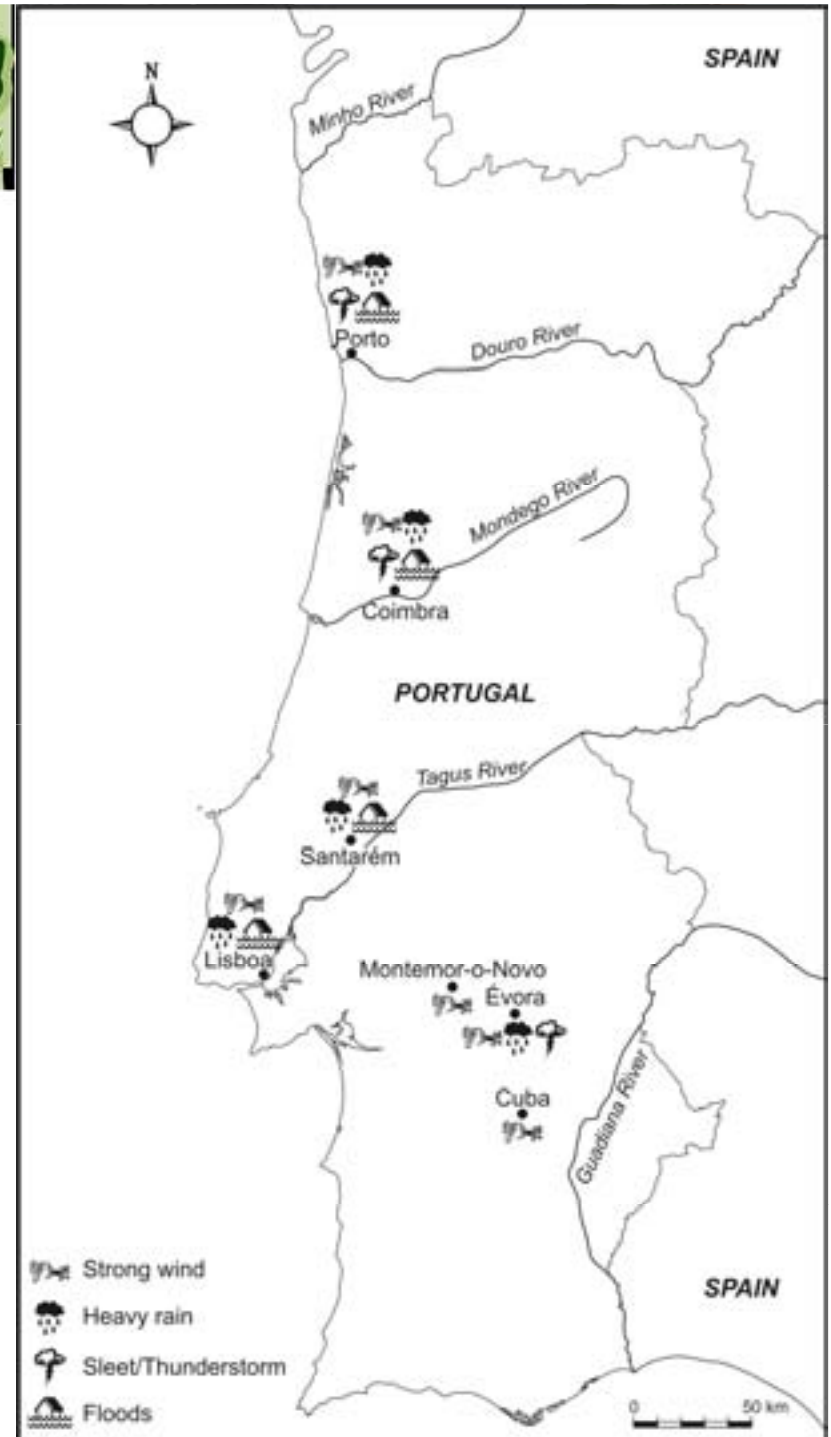
3-6 Déc 1739

**14 sources
documentales
différentes**

“Barbara storm”

**Sources individuelles
(incluant deux longs
poèmes) et la presse**

**Indications concernant les
caractéristiques des
Tempêtes et leurs dégâts**



HMS Namur AI

Moored at
on 14th No

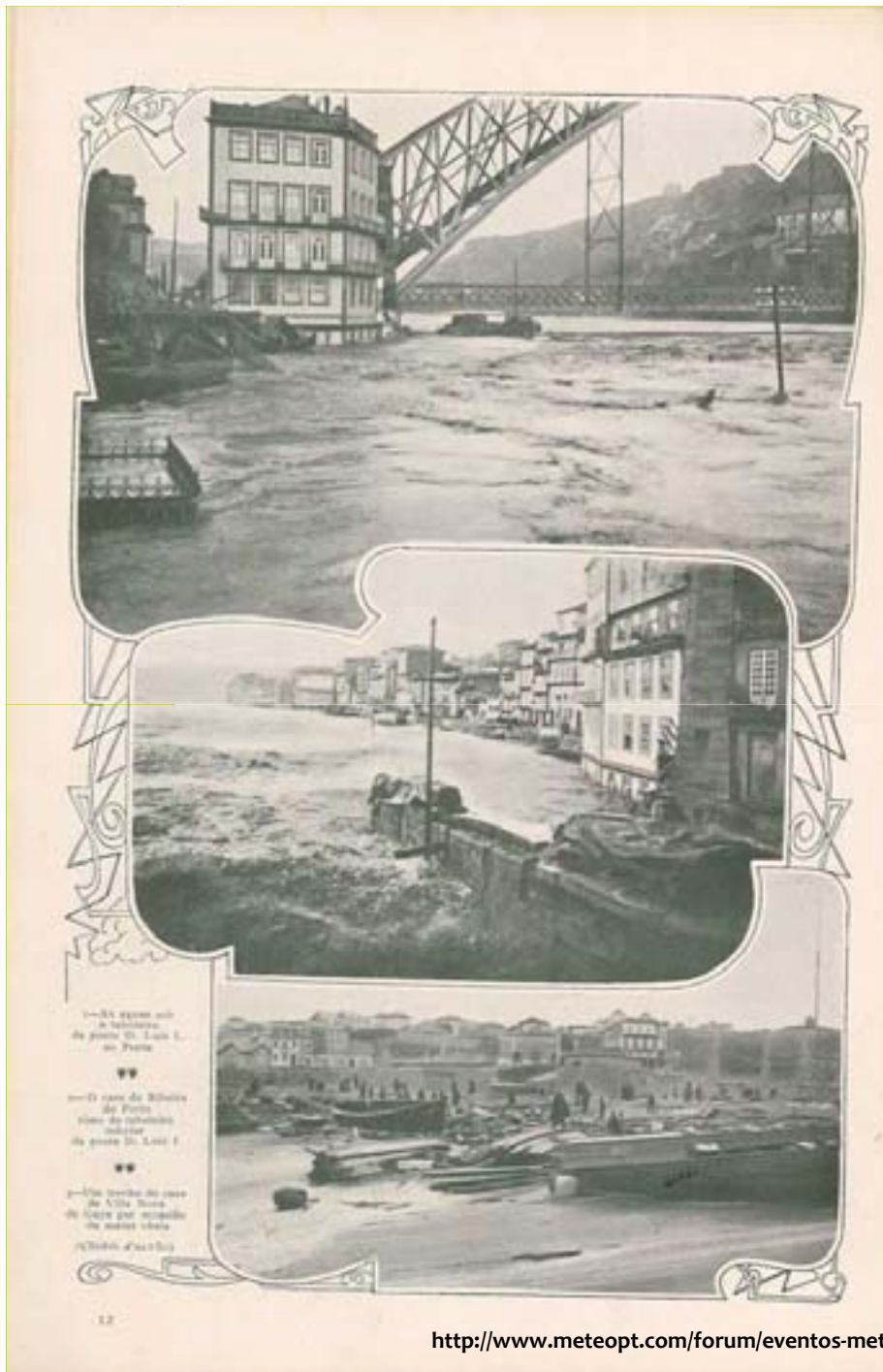
Moored in Lisbon having left St John's Newfoundland on 10th September (OS)
arrived in Lisbon on 6th November (OS)

Date (OS)	D	Date (OS)	Date (NS)	Wind direction	weather
21 Nov	2	21 Nov	2 Dec	SW	Strong gales of wind and thick rainy weather
22	3	22	3	WSW	Strong gales the Greyhound drove ashore in Ball Bay and made signal of distress
23	4	23	4	WSW: SW: WbS	Riding with the sheet and spare anchor ahead the ship driving. Hard gales and thick rainy weather at ½ past 8 PM a large Portuguese ship drove along side us the sea running so high and the ship labouring so hard against one another was obliged to cut 3 of her cables she having four anchors down and was obliged to cut our best and small bower cables at the butts before we could any way get clear of her, the best bower 5 fathoms within the 1 st splice and about 1/3 of the spare cable otherwise she would have damaged our ship very much she being a large ship heavy laden as soon as we got clear we let go the sheet anchor and moored the ship with the spare anchor in the morning very hard gales and rain with violent hard squalls which occasioned the ship to drive and brought both anchors ahead the St Albans and Seaford drove and about 15 or 16 sail of merchant ship drove ashore a Portuguese ship drove thwart one of their men of war broke and soon after foundered. The Portuguese ship being on board us stove our yard to pieces being in the Takles on the larboard side which side the Portuguese ship came on board us we fired 17 guns of distress. The Seaford yawl came to our assistance with the Lieutenant.
24	5	24	5	SW: NW	Hard gales of wind and violent hard squalls of rain the middle and latter parts moderate and cloudy
26	7				

Quadro I – Locais, informações e número de fontes disponíveis
 Table I – Places, information and number of available sources

	Vento Forte	Precipitação	Saraiva Trovoada	Cheia Inundação	Prejuízos	N.º de Fontes
Porto	✓	✓	✓	✓	✓	2
Coimbra	✓	✓	✓	✓	✓	3
Santarém	✓	✓		✓	✓	2
Lisboa	✓	✓		✓	✓	4
Montemor-o-Novo	✓				✓	1
Évora	✓	✓	✓		✓	3
Cuba	✓					1

*E mudados do Sul ao Norte os ventos
 Logo de improviso em hum instante
 Amnistia fizeraõ os elementos.*

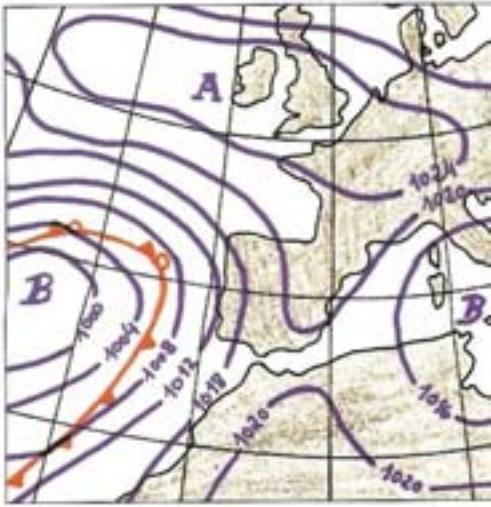


Decembre 1909

Em Dezembro de 1909 eclodiram violentos temporais em Portugal. A *Illustração Portuguesa* registava, no seu número de 3 de Janeiro de 1910, as primeiras reportagens em vários locais do país, nomeadamente Lisboa, Porto, Sacavém, Alenquer e Vila Nova de Gaia.

"Portugal devastado pelas águas" era o título usado.

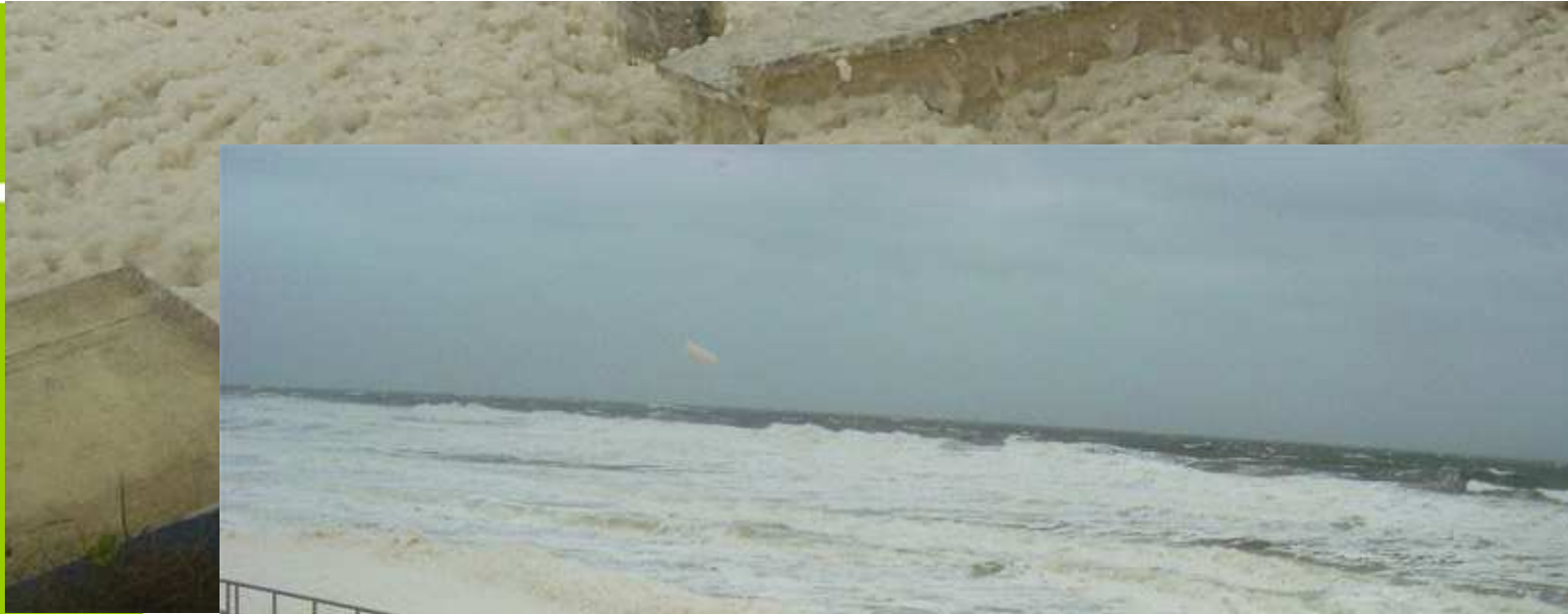
Contam que o temporal se iniciou a 22 de Dezembro e terminou a 24 do mesmo: Ficaram conhecidas pelas cheias de 1909, em Portugal. Aconteceu o mesmo fenómeno em Espanha e França. Entre os fotógrafos que cobriram esta tragédia, destaca-se a qualidade de Joshua Benoliel.





27 février 2010 <http://www.meteopt.com/pt/pt/portugal/temporal-27-fevereiro-2010-carcavelos-4292.html> **Carcavelos à l'Ouest de Lisbonne**











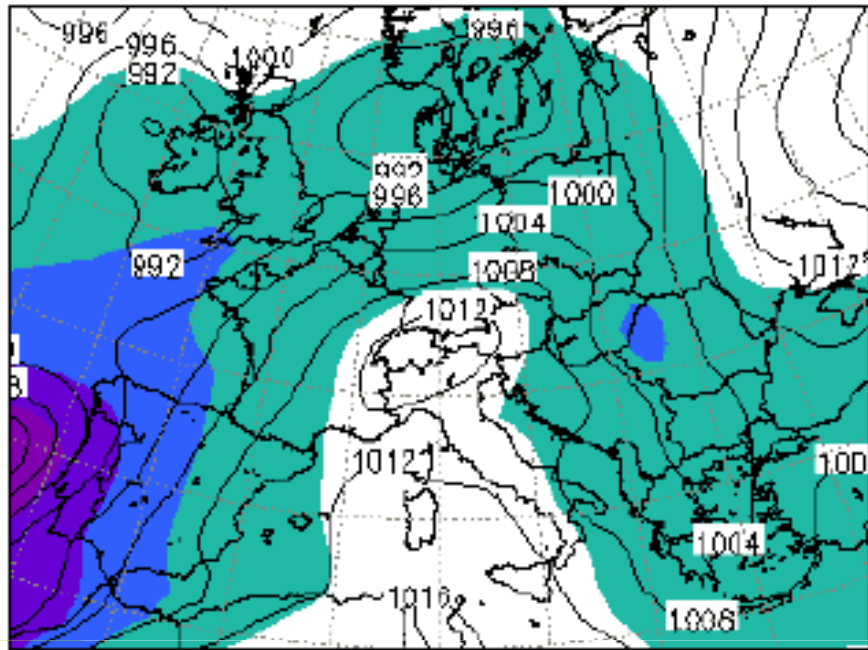


<http://www.meteopt.com/forum/portugal/temporal-27-fevereiro-2010-carcavelos-4292.html>

27 de Fevereiro de 2010

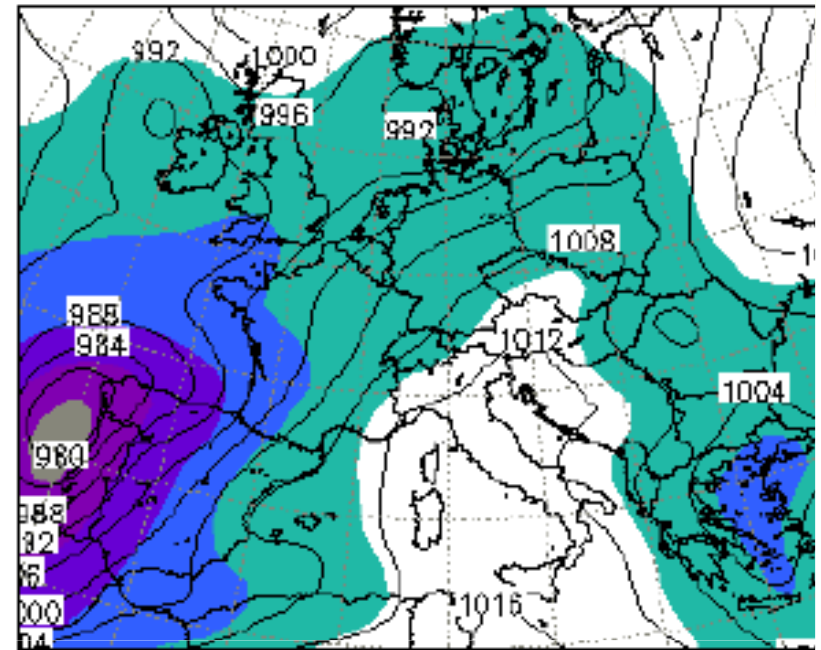


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e. GFS prmslmsl init:00Z28FEB2010 Valid:00Z28FEB2010

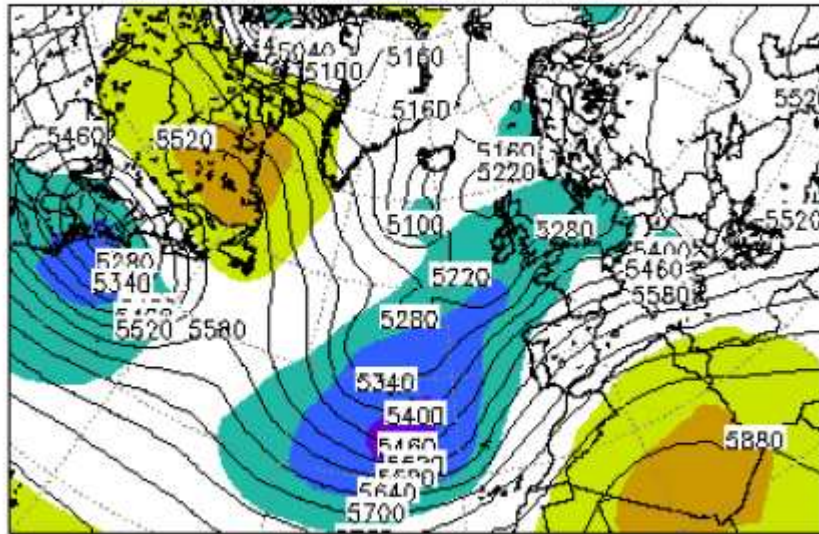
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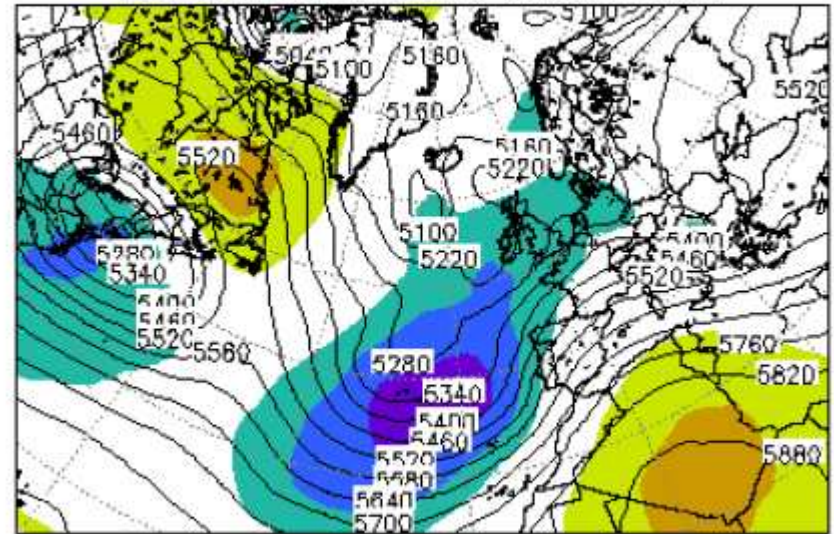
f. GFS prmslmsl init:06Z28FEB2010 Valid:06Z28FEB2010

Richard Grumm
National Weather Service

a.GFS hgtprs init:00Z27FEB2010 Valid:00Z27FEB2010



b.GFS hgtprs init:06Z27FEB2010 Valid:06Z27FEB2010





Conclusions